	Application No.	Applicant(s)
Notice of Allowability	10/660,976	VITALIANO ET AL.
	Examiner	Art Unit
	Russell S. Negin	1631
The MAILING DATE of this communication appears on the cover sheet with the correspondence address All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS. This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.		
1. This communication is responsive to the amendment of 11/20/2006 and the terminal disclaimer of 2/9/2007.		
2. X The allowed claim(s) is/are 1-42,44,48-52,54,55,58,59,62-64 and 66-68.		
 3. Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f). a) All b) Some* c) None of the: 1. Certified copies of the priority documents have been received. 2. Certified copies of the priority documents have been received in Application No. 3. Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)). *Certified copies not received: 		
Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.		
4. A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.		
 5. CORRECTED DRAWINGS (as "replacement sheets") must be submitted. (a) including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached 1) hereto or 2) to Paper No./Mail Date (b) including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d). 		
6. DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.		
Attachment(s)	5. ☐ Notice of Informal P	atont Application
 Notice of References Cited (PTO-892) Notice of Draftperson's Patent Drawing Review (PTO-948) 	6. ☐ Interview Summary	' '
3. ☑ Information Disclosure Statements (PTO/SB/08),	Paper No./Mail Dat 7. ⊠ Examiner's Amendn	e
Paper No./Mail Date <u>11/20/2006</u> 4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material	8. Examiner's Statement of Reasons for Allowance	
	9.	χ.

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Franco Vitaliano on 8 February 2007.

The application has been amended as follows:

In the claims:

Please amend the instant set of claims to included the following changes:

1. (Currently Amended): An isolated non-naturally occurring laser light source offering precise control over its fabrication and operation comprising:

a man-made cage, up to 100 nanometers in diameter, defining a calculated, artificial, environment-isolating cavity that is bioengineered and formed from a plurality of artificially-induced self-assembling purified Clathrin protein molecules, and one or more man-made cargo elements calculatedly located within the man-made cavity, wherein at least one of the cargo elements contains a man-made, artificially configured fluid and or a quantum dot,

wherein the cargo element cavity and or its contained fluid internally and calculatedly

reflects one or more artificially selected wavelengths of light in response to one or more

artificially selected and induced frequencies of electromagnetic excitation, and

wherein the non-natural laser light source, by human design, emits one or more photons of specified frequencies of light in response to a an one or more purposely induced types of stimuli, stimulus resulting in controlled lasing that is not practically utilized in naturally occurring systems, because by definition the latter do not offer the required precise control over their fabrication and operation,

and

which stimuli can further have the optional effect, by human design, of calculatedly deforming deforms the cargo element cavity-in-order to tune its Q value and resonant frequency-in-a purposely controlled fashion.

- 2. (Currently Amended): An isolated non-naturally occurring laser light source according to claim 1 comprising, artificially configured receptors for artificially capturing and calculatedly-positioning one or more artificially configured cargo elements within the man-made self-assembling protein cavity such that it enables non-natural placement of one or more cargo elements with minimal inter-element spacings, thereby allowing dense-cargo element packing and with minimal inter-cargo interference.
- 3. (Currently Amended): An isolated non-naturally occurring laser light source according to claim 2 comprising,

 an artificial vesicle located within the artificially configured cage and enclosing one or more artificially configured cargo elements, wherein the artificially configured receptors

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extend through the man-made vesicle to capture and calculatedly position a artificially configured cargo element within the man-made vesicle such that it enables non-natural placement of one or more cargo elements with minimal inter-element spacings and with minimal inter-cargo interference.

- 4. (Currently Amended): An isolated non-naturally occurring laser light source according to claim 3 comprising, artificially configured adaptors calculatedly disposed between the receptors and the artificially configured cage and artificially binding to the one or more artificially configured receptors such that it enables non-natural placement of one or more cargo elements within the man-made vesicle.
- 5. (Currently Amended): An isolated non-naturally occurring laser light source according to claim 1 comprising,
 a man-made vesicle located within the artificially configured cage and artificially and calculatedly enclosing one or more artificially configured cargo elements.
- 6. (Currently Amended): An isolated non-naturally occurring laser light source according to claim 1 comprising,

 artificially configured molecular tethers for calculatedly capturing and non-naturally positioning one or more artificially configured cargo elements within and or outside the man-made cavity.

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7. (Currently Amended): An isolated non-naturally occurring laser light source

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according to claim 1 comprising,

artificially-configured direct cage bonding for calculatedly capturing and non-naturally

positioning one or more artificially configured cargo elements within and or outside the

man made cavity.

8. (Currently Amended): An isolated non-naturally-occurring laser light source

according to claim 1 further comprising,

artificially configured receptors, molecular tethers and direct cage bonding for

calculatedly capturing and non-naturally positioning one or more artificially configured

cargo elements within and or outside the man-made cavity.

9. (Currently Amended): An isolated non-naturally occurring laser light source

according to claim 1 further comprising,

one or more artificially configured cargo elements forming a non-permeable

calculated, man-made cavity.

10. (Currently Amended): An isolated non-naturally-occurring laser light source

according to claim 3 further comprising,

a man-made vesicle forming an artificial, non-permeable, calculated, man-made cavity.

11. (Currently Amended): An isolated non-naturally occurring laser light source according to claim 3 comprising,

a vesicle defining a man-made cavity located within the artificially configured cage, wherein a artificially configured fluid and or a artificially configured quantum dot are by design contained in the man-made vesicle cavity.

- 12. (Currently Amended): An isolated non-naturally-occurring laser light source according to claim 1, wherein the artificially-configured self-assembling cage is manmade to be electrically neutral and that the cage calculatedly inhibits charge transfer between the man-made cage and its enclosed, artificially-configured cargo elements.
- 13. (Currently Amended): An isolated non-naturally-occurring laser light source according to claim 3, wherein the artificially-configured vesicle is man-made to be electrically neutral and that the vesicle calculatedly inhibits charge transfer between the man-made vesicle and its enclosed, artificially-configured cargo elements.
- 14. (Currently Amended): An isolated non-naturally occurring laser light source according to claim 4, wherein the artificially-configured receptors and adaptors are by human design electrically neutral and calculatedly inhibit charge transfer between the man-made vesicle and artificially-configured cage and their enclosed, artificially configured cargo elements.

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15. (Currently Amended): An isolated non-naturally occurring laser light source according to claim 1, wherein the artificially configured cage calculatedly and by human design reduces natural and man-made contaminant background radiation to artificially configured cargo carried within the man-made cage.

- 16. (Currently Amended): An isolated non-naturally occurring laser light source according to claim 3, wherein the man-made vesicle by human design reduces natural and man-made contaminant background radiation to artificially configured cargo carried within the vesicle.
- 17. (Currently Amended): An isolated non-naturally occurring laser light source according to claim 1 comprising, a artificial, self-assembling framework of artificially configured cages to that by human-design structurally support one or more self-assembling artificial light sources in order to produce a man-made design.
- 18. (Currently Amended): An isolated non-naturally occurring laser light source according to claim 1 comprising an artificially configured, self-assembling, deliberately electrically neutral substrate of artificially configured cages to structurally support one or more of the artificially configured self-assembling, artificially configured light sources, forming a man-made design.

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19. (Currently Amended): An isolated non-naturally occurring laser light source according to claim 1 comprising, an artificially configured self-assembling framework of artificially configured cages to purposely structurally order one or more self-aligning artificial light sources, forming a man-made design.

- 20. (Currently Amended): An isolated non-naturally occurring light source according to claim 1, wherein the one or more artificially configured cargo elements is a artificially configured single cargo element comprising a artificially configured cargo element that defines a man-made cavity that purposely contains a artificially configured fluid and or a artificially configured quantum dot.
- 21. (Currently Amended): An isolated non-naturally occurring light source according to claim 1, wherein the plurality of artificially configured cargo elements are purposely a plurality of artificially configured cargo elements.
- 22. (Currently Amended): A light source according to claim 21, wherein the plurality of artificially configured cargo elements are man made light source cargo elements.
- 23. (Currently Amended): An isolated non-naturally occurring light source according to claim 21, wherein the plurality of artificially configured cargo elements are man-made to be non-light source cargo elements.

24. (Currently Amended): An isolated non-naturally occurring light source according to claim 21, wherein at least some of the plurality of artificially-configured cargo elements are artificially-configured light source cargo elements.

- 25. (Currently amended): An isolated non-naturally occurring light source according to claim 21, wherein at least some of the plurality of artificially configured cargo elements are artificially configured non-light source cargo elements.
- 26. (Currently amended): An isolated non-naturally occurring laser light source according to claim 1, wherein the artificially configured cargo elements calculatedly respond to purposely and artificially directed stimuli internal and external to the manmade cage.
- 27. (Currently amended): An isolated non-naturally occurring laser light source according to claim 3, wherein a man-made vesicle and its contained artificially configured cargo elements calculatedly respond to purposely and artificially directed stimuli that are internal and or external to the man-made vesicle.
- 28. (Currently Amended): An isolated non-naturally occurring laser light source according to claim 1, wherein an artificially configured cargo element also contains an artificially configured fluid and or the man-made vesicle-contained encapsulates an artificially configured fluid that contains one or more artificially configured, performance

altering dyes of any suitable type, with or without artificially configured, performance altering scattering particles, or with or without other artificially configured, performance altering dopants that calculatedly produce any chosen adjustment to lasing characteristics, of any man-made design.

- 29. (Currently Amended): An isolated non-naturally occurring laser light source according to claim 21, wherein a subset of the artificially configured cargo elements include one or more artificially configured liquids without dopants or with one or more artificially configured performance altering dopants type that calculatedly produce any chosen adjustment to lasing characteristics, of any man made design.
- 30. (Currently Amended): An isolated non-naturally occurring laser light source according to claim 21, wherein a subset of the artificially configured cargo elements include a artificially-configured performance altering gas or artificially configured performance altering vapor without dopants or with one or more types of artificially configured performance altering dopants of any suitable type that calculatedly produce any chosen adjustment to lasing characteristics, of any man-made design.
- 31. (Currently Amended): An isolated non-naturally occurring laser light source according to claim 1, wherein a artificially configured cargo element cavity containing one or more artificially configured quantum dots comprise a artificially configured

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photonic dot type that calculatedly produces any chosen lasing characteristics, of any man-made design.

- 32. (Currently Amended): An isolated non-naturally occurring laser light source according to claim 3, wherein a man-made vesicle cavity containing one or more artificially configured quantum dots comprises a artificially configured photonic dot type that calculatedly produces any chosen lasing characteristics, of any man-made design.
- 33. (Currently Amended): An isolated non-naturally occurring laser light source according to claim 1, wherein the an optional, artificially induced internal or external man made cavity deforming stimulus includes one or more artificially induced stimuli of any suitable chosen type, including but not limited to mechanical, chemical, fluidic, biological, photonic, thermal, sonic, and electrical or electromagnetic stimuli type that calculatedly produce any chosen lasing characteristics, of any man-made design.
- 34. (Currently Amended): An isolated non-naturally occurring laser light source according to claim 1, wherein a man-made spherical cargo element cavity and or a man-made spherical vesicle cavity is optionally and artificially induced to be deforming deformed in response to an artificially induced external stimulus, and by human design, the artificially deformed spherical cavity is purposely assumes the configuration of an asymmetric resonant cavity (ARC).

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35. (Currently Amended): An isolated non-naturally occurring laser light source according to claim 1, wherein a artificially configured spherical fluid droplet contained within a artificially configured spherical cargo element cavity and or contained within a artificially configured spherical vesicle cavity is optionally and purposely deformed in response to a purposely deformed cargo element cavity and or to a purposely deformed vesicle cavity, and the so-purposely deformed spherical droplet thereby becomes, an by human design, an asymmetric resonant cavity (ARC) type that calculatedly produces any chosen lasing characteristics, of any man-made design.

- 36. (Currently Amended): An isolated non-naturally occurring laser light source according to claim 1, wherein the artificially configured ARC optionally deforms from a first preferred geometry to a second preferred geometry and the desired wavelength of the one or more photons is dependent on the second geometry.
- 37. (Currently Amended): An isolated non-naturally-occurring laser light source according to claim 1, wherein selectable, preferred quantum dot energy emissions are used to purposely tune the Q-value and resonant frequency of the artificially configured ARC photonic dot type to calculatedly produce any chosen Q-value and resonant frequency, of any man-made design.
- 38. (Currently Amended): An isolated non-naturally occurring laser light source

according to claim 1, wherein any chosen Q-value (whispering gallery modes) and resonant frequency of the man-made laser are purposely tunable by using an artificially configured ARC to calculatedly produce any chosen Q-value and resonant frequency of any-man-made design.

- 39. (Currently Amended): An isolated non-naturally occurring laser light source according to claim 1, wherein the artificially configured ARC is a Q-switched laser, whose Q value is purposely controlled to calculatedly produce any chosen Q value and resonant frequency, of any man-made design.
- 40. (Currently amended): An isolated non-naturally occurring laser light source according to claim 1, wherein the man-made laser light source is an ultrabright, a purposely tunable source of light-to calculatedly produce any chosen wavelength and/or intensity of light, of any man-made design.
- 41. (Currently Amended): An isolated non-naturally occurring laser light source according to claim 1, wherein there is the ability to purposely couple a chosen high-Q/whispering gallery mode out of the man-made ARC with a directionality in order to calculatedly produce any chosen lasing directionality, of any man-made design.

42. (Currently Amended): An isolated non-naturally occurring laser light source according to claim 1, wherein it operates at an ultralow threshold by human design to calculatedly produce any chosen lasing threshold, of any man-made design.

- 44. (Currently amended): An isolated non-naturally occurring laser light source according to claim 1, wherein the man-made laser light source include one or more is a therapeutic single task and or multitask in vivo and or in vitro agents that are calculatedly induced to perform a task.
- 48. (Currently Amended): An isolated non-naturally occurring laser light source according to claim 1, wherein the man-made cage is bioengineered in whole or in part.
- 49. (Currently Amended): An isolated non-naturally-occurring laser light source according to claim 1, wherein the artificially induced self-assembling protein molecule is a purified clathrin molecule.
- 50. (Currently Amended): An isolated non-naturally occurring laser light source according to claim 1, wherein the man-made cage comprises artificially induced self-assembling synthetic protein molecules.

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51. (Currently amended): An isolated non-naturally occurring laser light source according to claim 4, wherein artificially configured receptors, adaptors, and or vesicle comprise natural and or synthetic protein molecules.

- 52. (Currently Amended): An isolated non-naturally occurring laser light source according to claim 4, wherein the artificially-configured receptors, adaptors, and vesicle are bioengineered at least in part.
- 54. (Currently amended): An isolated non-naturally occurring laser light source according to claim 3, wherein the artificially configured vesicle is calculatedly coated at least partially in a substantially reflective material in one or more materials that purposely enhance any chosen performance parameter of the vesicle, of any manmade design.
- 55. (Currently amended): An isolated non-naturally occurring laser light source according to claim 1, wherein the man-made cage is calculatedly coated at least partially in a substantially non-reflective material in one or more materials that purposely enhance any chosen performance parameter of the cage, of any man-made design.
- 58. (Currently amended): An isolated non-naturally occurring laser light source according to claim 4, wherein the artificially configured receptors, adaptors, and vesicle

are at least partially metal coated in one or more materials that purposely enhance any chosen performance parameter, of any man made design.

- 59. (Currently Amended): An isolated non-naturally occurring laser light source according to claim 1, wherein the man-made cage is artificially induced to be greater than about one nanometer in diameter.
- 62. (Currently Amended): An isolated non-naturally-occurring laser light source according to claim 1, wherein the man-made cage is artificially induced to be substantially symmetric with respect to a plane in-order to facilitate any chosen performance characteristic, of any man-made design.
- 63. (Currently Amended): An isolated non-naturally occurring laser light source element according to claim 1, wherein the cage has been artificially ordered to substantially have icosahedral geometry in order to facilitate any chosen performance characteristic, without of any man-made design.
- 64. ((Currently amended): An isolated non-naturally occurring light source according to claim 1, wherein by means-of-artificial inducement multiple artificially configured light sources are physically and or functionally linked together in order to facilitate any manmade design.

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range, and

- 66. (Currently amended): An isolated non-naturally occurring laser light source according to claim 1, wherein the artificially configured laser light source, by means of artificial inducement, forms a hybrid system upon its physical and or functional integration with other chosen elements in vitro and or in vivo in order to facilitate any man-made design, of any man-made design.
- 67. (Currently Amended): A method for forming an isolated non-naturally occurring light source comprising artificially induced self-assembling protein molecules into that forming a man-made cage defining a calculated, artificial, environment isolating cavity, and locating one or more artificially configured cargo elements within the man-made cavity, wherein, at least one of the artificially-configured cargo elements defines a man-made cavity that contains an artificially configured fluid and/or a artificially configured quantum dot, wherein the artificially configured cargo element cavity and or its contained artificially configured fluid internally reflects one or more wavelengths of light in a-specified response to an artificially induced electromagnetic excitation of a purposely-specified

wherein the man-made laser light source purposely emits one or more photons of light in a specified frequency and or light intensity, and further,

in optional response to an artificially induced stimulus, optionally deforming deforms the artificially configured cargo element cavity into a geometry that is, by human design, characteristic of an asymmetric resonant cavity.

function, of any man-made design.

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68. (Currently Amended): A laser light source according to claim 1 comprising, a purposely functionalized cage for deliberately attaching one or more artificially configured elements external to the man-made cage in order to facilitate any chosen

Conclusion

Papers related to this application may be submitted to Technical Center 1600 by facsimile transmission. Papers should be faxed to Technical Center 1600 via the central PTO Fax Center. The faxing of such pages must conform with the notices published in the Official Gazette, 1096 OG 30 (November 15, 1988), 1156 OG 61 (November 16, 1993), and 1157 OG 94 (December 28, 1993)(See 37 CFR § 1.6(d)). The Central PTO Fax Center Number is (571) 273-8300.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Russell Negin, Ph.D., whose telephone number is (571) 272-1083. The examiner can normally be reached on Monday-Friday from 7am to 4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's Supervisor, Irem Yucel, Supervisory Patent Examiner, can be reached at (571) 272-0781.

Information regarding the status of the application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information on the PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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16 February 2007

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JOHN S. BRUSCA, PH.D PRIMARY EXAMINER

18. Gruce 16 February 2007